

### REMARKS

Favorable reconsideration of this application in view of the remarks to follow and allowance of the claims of the present application are respectfully requested.

Applicants acknowledge with thanks the Examiner's statement that Claims 2-6, 9 and 11 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claim. However, applicants submit not to adopt the Examiner's suggestion at the present time for the reasons discussed below.

Claims 1, 7, 8 and 10 stand rejected under 35 U.S.C. §103(a), as allegedly unpatentable over the disclosure of U.S. Patent Application Publication 2002/0195565 to Lecoq (hereinafter "Lecoq"). More specifically, the Examiner contends that Claim 25 of Lecoq recites the basic compound of  $\text{LuYAlO}_3$ , and thereby concludes that it would be obvious to one skilled in the art to optimize the basic parameters to form  $\text{LuYAlO}_3$  on a LSO layer with electrodes, as claimed in the present invention.

Applicants respectfully submit that the Examiner fails to establish a *prima facie* case of obviousness as discussed below.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the cited reference must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the reference, not based on applicants' disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Lecoq does not teach or remotely suggest applicants' claimed article of manufacture comprising a substrate and a layer of  $N_{(x)}Y_{(1-x)}AlO_3$  on the substrate where  $x$  is a molar fraction greater than zero and less than one, and  $N$  is an element selected from the group consisting of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu. Lecoq discloses a positron emission tomography (PET) camera or scanner comprising a plurality of scintillators, wherein the scintillators comprise LuAP ( $LuAlO_3:Ce$ ) based crystals. Lecoq also discloses that the LuAP may include Yttrium to form LuYAP. It is well known in the art that LuAP, which stands for Lutetium Aluminium Perovskite, is a scintillator crystal having a formula of  $LuAlO_3:Ce$ . Lecoq also teaches that LuAP is  $LuAlO_3:Ce$  (See at the last line of paragraph [0017] and the last line of paragraph [0022]). That is, LuAP is a photonic material of  $Ce^{3+}$  doped  $LuAlO_3$ . Accordingly, LuYAP of Lecoq is a photonic material of  $Ce^{3+}$  doped  $LuYAlO_3$ . It is common knowledge in the art that the  $Ce^{3+}$  is introduced into the material during the growth thereof (see also paragraph [0012] of Lecoq). As such, in Lecoq  $Ce^{3+}$  is present in the scintillator material, which is not present in the claims of the present application. Further, nowhere does Lecoq disclose or suggest the removal of  $Ce^{3+}$  from the disclosed scintillator material. The present invention teaches that preferred embodiments, i.e.,  $La_xY_{(1-x)}AlO_3$ , are alloys of  $YAlO_3$  and  $LaAlO_3$  (lines 7-16, page 3). Thus,  $N_{(x)}Y_{(1-x)}AlO_3$  of the present invention are alloys of  $YAlO_3$  and  $NaAlO_3$ , and  $LuYAlO_3$  of the present invention is an alloy of  $YAlO_3$  and  $LuAlO_3$ . Thus, the cited reference does not teach or suggest the claimed invention.

Further, there is no suggestion in Lecoq which motivates one skilled in the art to modify the disclosed photonic material of  $Ce^{3+}$  doped  $LuAlO_3$  in such a way to make and use an article of manufacture comprising a substrate and a layer of  $N_{(x)}Y_{(1-x)}AlO_3$  on the substrate where  $x$  is a molar fraction greater than zero and less than one, and  $N$  is an element selected from the

group consisting of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu. The Lecoq material and the claimed inventive dielectric materials are directed for markedly different uses in two distinct technological fields. Specifically, Lecoq is directed to the use of LuAP or LuYAP crystals, which when applied to a PET camera provide greater image sharpness (paragraph [0047] of Lecoq), while the present invention is directed to the use of the inventive dielectric materials in CMOS devices to increase the performance of microprocessors. The teaching of Lecoq focuses on increasing the sensitivity and the spatial resolution of PET cameras or scanners (paragraphs [0009] – [0028]), and does not concern the reduction of device feature size and the avoidance of electrical breakdown as the present invention does. Moreover,  $\text{Ce}^{3+}$  is used in Lecoq to provide scintillators of different speeds. There is no teaching or suggestion of removing  $\text{Ce}^{3+}$  from the prior art material. Applicants further submit that since  $\text{Ce}^{3+}$  is introduced during the growth of the prior art material, the claimed layer of  $\text{N}_{(x)}\text{Y}_{(1-x)}\text{AlO}_3$  is not formed.

More, applicants submit that in view of the intended use of the Lecoq material, one skilled in the medical imaging field would not be motivated to modify LuYAP in such a way to arrive at the claimed  $\text{LuYAlO}_3$  which does not contain  $\text{Ce}^{3+}$ . It is common knowledge in the medical imaging field that recharge processes of a scintillator crystal cause electron trapping in the crystal thereby decreasing the sensitivity and the spatial resolution. It is also known in the art that  $\text{Ce}^{3+}$  ions can prevent electron trapping and suppress the recharge processes in the scintillating crystals. Thus, one skilled in the art would recognize that the presence of  $\text{Ce}^{3+}$  ions in LuAP or LuYAP crystals of Lecoq is critical for their intended use as scintillators, and thereby would not modify LuYAP to form  $\text{LuYAlO}_3$  which does not contain  $\text{Ce}^{3+}$  and apply the same  $\text{LuYAlO}_3$  on a LSO layer with electrodes as suggested by the Examiner. “The mere fact that the

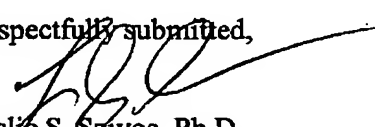
prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." In re Vaeck, 947 F.2d, 488, 493, 20 USPQ 2d. 1438, 1442 (Fed.Cir. 1991).

Accordingly, applicants respectfully submit that Claims 1, 7, 8 and 10 are not rendered obvious by the disclosure of Lecoq.

The rejection under 35 U.S.C. §103(a) has been obviated; therefore reconsideration and withdrawal thereof is respectfully requested.

Thus, in view of the foregoing remarks, it is firmly believed that the present case is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,



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